

## Abstract

A replacement sensor model for optimally exploiting imaging data obtained by an image sensor. The replacement sensor model includes a ground-to-image function such as a polynomial for converting three-dimensional ground point data to two-dimensional image (pixel) data. Coefficients of the polynomial can be determined from a rigorous sensor model of the image sensor, which reflects physical characteristics of the particular image sensor. The polynomial can be adjusted by an adjustment vector. The adjustment vector can be determined from a pre-determined list of possible adjustment components having particular characteristics relating to the image sensor and reflecting errors in the physical characteristics of the image sensor as included in the rigorous sensor model. Finally, an error covariance associated with the adjustment vector can be determined from an error covariance associated with the rigorous sensor model. The adjusted polynomial and error covariance of the replacement sensor model permit optimal image exploitation, including error propagation and geopositioning.

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